



Influence of Seed Treatment and Foliar Spray of *Panchakavya* on Growth, Yield Attributes and Yield of *Amaranthus viride*

K. Venkatalakshmi*, A. Balasubramanian and N. Sankaran

Department of Agronomy,
Tamil Nadu Agricultural University, Coimbatore-641 003

Field experiment was conducted during *rabi* 2003 to study the response of amaranthus to seed treatment and foliar spray of panchakavya. The experiment was carried out in the Eastern block farm of Tamil Nadu Agricultural University, Coimbatore. The design was split plot design with three replications. Main plot treatment included control and seed soaked in panchakavya solution. In sub plot control and foliar spray of panchakavya with 3 and 6% concentration were imposed. In main plot the maximum growth, yield attributes and green leaf yield (9.30 t/ha) were recorded in seed soaked with panchakavya at 3% concentration. With respect to sub plot, foliar spray of panchakavya at 3%, concentration recorded significantly higher growth and green leaf yield (10.05 t/ha). There is no significant interaction between the seed soaking and foliar spray of panchakavya treatments.

Keywords: amaranthus, panchakavya, seed soaking, foliar spray.

India is the second largest producer of vegetables (next to china) in the world. Even though, per day requirement of 300 g of vegetables / adult cannot be met out. Among the vegetables, green leaf vegetable contains most perfect combinations of carbohydrate, proteins, vitamins and minerals. Amaranths are the most popular leafy vegetable referred as poor man's spinach. The main reason for low production of vegetable is less nutrient supply. So the production can be increased by the supply of nutrients. Availability of information on nutrient management especially through organic sources of amaranths is scanty. Panchakavya is the single organic input, which can act as growth promoter, fertilizer, bio pesticide. So present study was carried out with the objective to find the response of amaranthus to seed soaking and foliar spray of panchakavya on growth and yield.

Materials and Methods

Field experiment was conducted during *rabi* 2003. The experiment was laid out in the Eastern

block farm of Tamil Nadu Agricultural University, Coimbatore. Split plot design was followed with three replications. The treatments included two main plot (control and seed soaked in panchakavya solution for 6 hours) and three sub plot (control and foliar spray of panchakavya with 3 and 6% concentration) treatments. Foliar spray was carried out on 13 and 23 DAS. The crop was grown under irrigated condition.

Preparation of panchakavya

The present form of panchakavya stock solution is essentially a product containing 2.5 kg of cow dung, 1.5 l of cow urine, 1 l of cow milk, 1 l of cow curd, 500 g of cows ghee and also 1.5 l of sugar cane juice, to accelerate the fermentation. It was stored in a earthen pot kept in the open and shade place. It should be stirred both in the morning and evening. In seven days the panchakavya will be ready. From the stock solution varying concentrations were prepared according to the requirement. The spray solution was sprayed using hand sprayer with higher pore size nozzle.

*Corresponding author

Results and Discussion

Seed soaking treatment with panchakavya

The seeds soaked in panchakavya solution recorded significantly higher plant height, no. of leaves, leaf area index and leaf stem ratio at 15, 25 DAS. (Table 1 and 2).

Higher dry matter yield (1.49 t/ha) and green leaf yield (9.30 t/ha) were recorded in seeds soaked with panchakavya solution at 3% concentration for 6 hours when compared to control. Panchakavya soaking induces early germination and produce vigorous seedling due to the nutrient supply by this solution. So the

Table 1. Effect of seed treatment and foliar spray of *panchakavya* on the growth characters of *Amaranthus* at 15 DAS

Treatments	Plant height (cm)		No.of leaves		LAI		Leaf stem ratio	
Main plot								
S ₀	8.7		28.12		0.127		1.410	
S ₁	9.6		29.63		0.179		1.679	
Sub plot								
C ₀	9.2		28.72		0.145		1.572	
C ₁	9.2		28.90		0.152		1.533	
C ₂	9.2		29.01		0.155		1.536	
	SEd	CD	SEd	CD	SEd	CD	SEd	CD
S	0.14	0.6	0.24	1.06	0.07	0.031	0.05	0.224
C	0.22	NS	0.26	NS	0.18	NS	0.03	NS
SXC	0.17	NS	0.28	NS	0.00	NS	0.06	NS
CXS	0.31	NS	0.37	NS	0.02	NS	0.21	NS

S₀ control and S₁ seed soaked in panchakavya solution for 6 hours in sub plot C₀ control and C₁ foliar spray of panchakavya with 3% and C₂ foliar spray of panchakavya with 6 % concentration.

Table 2. Effect of seed treatment and foliar spray of *panchakavya* on the growth characters *Amaranthus* at 25 DAS

Treatments	Plant height (cm)		No.of leaves		LAI		Leaf stem ratio	
Main plot								
S ₀	18.28		62.56		0.348		1.320	
S ₁	19.83		68.98		0.501		1.489	
Sub plot								
C ₀	18.47		65.08		0.380		1.322	
C ₁	19.35		66.10		0.422		1.435	
C ₂	19.36		66.14		0.453		1.443	
	SEd	CD	SEd	CD	SEd	CD	SEd	CD
S	0.27	1.2	1.04	4.56	0.02	0.112	0.02	0.124
C	0.30	NS	0.26	0.8	0.02	0.059	0.04	0.096
SXC	0.34	NS	1.20	NS	0.02	NS	0.03	NS
CXS	0.43	NS	0.48	NS	0.01	NS	0.03	NS

S₀ control and S₁ seed soaked in panchakavya solution for 6 hours in sub plot C₀ control and C₁ foliar spray of panchakavya with 3% and C₂ foliar spray of panchakavya with 6 % concentration.

Table 3. Effect of seed treatment and foliar spray of *panchakavya* on the growth characters, DMP and green leaf vegetable yield of *Amaranthus* at maturity stage

Treatments	No.of leaves		GLY(t/ha)		DMY(t/ha)	
Main plot						
S ₀	93.30		7.30		1.18	
S ₁	99.47		9.30		1.49	
Sub plot						
C ₀	94.30		6.50		1.01	
C ₁	98.57		10.05		1.66	
C ₂	96.28		8.35		1.34	
	SEd	CD	SEd	CD	SEd	CD
S	0.91	3.95	0.32	1.42	0.05	0.22
C	0.73	1.62	0.61	1.4	0.10	0.24
SXC	1.058	NS	0.40	1.487	0.05	0.23
CXS	0.979	NS	0.86	1.99	0.14	0.34

S₀ control and S₁ seed soaked in *panchakavya* solution for 6 hours in sub plot C₀ control and C₁ foliar spray of *panchakavya* with 3% and C₂ foliar spray of *panchakavya* with 6 % concentration.

Table 4. Interaction effect of seed soaking and foliar spray of *panchakavya* on green leaf yield of *Amaranthus viride*.

Treatments	C ₀	C ₁	C ₂	Mean
S ₀	6.1	9.05	7.75	7.30
S ₁	6.9	11.05	8.95	9.30
Mean	6.5	10.05	8.35	8.30
Treatments		SEd	CD(P=0.05)	
S		0.32	1.42	
C		0.61	1.40	
SXC		0.40	1.48	
CXC		0.86	1.99	

S₀ control and S₁ seed soaked in *panchakavya* solution for 6 hours in sub plot C₀ control and C₁ foliar spray of *panchakavya* with 3% and C₂ foliar spray of *panchakavya* with 6 % concentration.

Table 5. Interaction effect of seed soaking and foliar spray of *panchakavya* on dry matter yield of *Amaranthus viride*.

Treatments	C ₀	C ₁	C ₂	Mean
S ₀	0.86	1.49	1.20	1.18
S ₁	1.16	1.84	1.49	1.49
Mean	1.01	1.66	1.34	1.34
Treatments		SEd	CD(P=0.05)	
S		0.05	0.22	
C		0.10	0.24	
SXC		0.05	0.23	
CXC		0.14	0.34	

S₀ control and S₁ seed soaked in *panchakavya* solution for 6 hours in sub plot C₀ control and C₁ foliar spray of *panchakavya* with 3% and C₂ foliar spray of *panchakavya* with 6 % concentration.

growth, yield attributing characters and yield were recorded highest.

Foliar spray of panchakavya

There is no significant difference between the treatments up to 15 DAS, because the spraying is given only at 13 DAS. Number of leaves, LAI and leaf stem ration were higher in 3 % foliar spray of panchakavya, which was on par with 6% spray (Table 2) at 25 DAS.

Yield

The dry matter production(1.66 t/ha) and green leaf yield (10.05 t/ha) were also significantly higher in 3% concentration of foliar spray of panchakavya (Table 3). This was on par with 6% concentration of foliar spray of panchakavya due supply of optimum level of major nutrients by Panchakavya. It enhances the growth of plant there by photosynthetic area i.e leaf area, which ultimately increased the green leaf yield. Similar results were reported by Somasundaram, 2003 and Kanimozhi, 2003. Increasing level of panchakavya beyond 3% level caused scorching, and resulted in decrease of photosynthetic area there by photosynthetic activity, which ultimately resulted in decrease of yield.

Interaction effect of seed soaking and foliar spray of panchakavya

Interaction between seed soaking and foliar spray of panchakavya was not found to be significant on plant height, number of leaves, leaf area index, leaf stem ratio of *Amaranthus viride* at all stages of crop.

Interaction effects between SXC and CXS were significant on green leaf yield and dry matter yield of the *Amaranthus viride*. In SXC interaction, at all seed soaking, 3% foliar spray of panchakavya recorded significantly high green leaf yield and dry matter yield. (Table 5) This was comparable with 6% foliar spray of panchakavya. Among the combinations seed soaking of panchakavya, with 3% foliar spray of panchakavya recorded high green leaf yield and dry matter yield were recorded in *Amaranthus viride*.

Reference

- Kanimozhi, C. 2003. Standardisation of organic production package for *Coleus forskohi* Brig. M.Sc. (Ag) Thesis, Tamil Nadu Agricultural University, Coimbatore, India.
- Somasundaram, E., Sankaran, V., Meena, S., Thiyagarajan, T.M., Chandragiri, K. and Panner selvam, S. 2003. Response of green gram to varied levels of panchakavya (org.nutrition) foliar spray. *Madras Agric.J.*, **90**: 169-172.

Manuscript number : 142/08
 Date of receipt : July 30, 2008
 Date of acceptance : June 8, 2009